also standard books in other departments of literature and selected periodicals will be on sale."

It has been decided by the promoters to limit the cost of the land and the building to 20,000 pounds, leaving 10,000 pounds for carrying on the work of the Institute. Persons in sympathy with the project are requested to communicate with Mr. Watts at his address, 17 Johnson's Court, Fleet St., London, E. C., and to state whether they will support the undertaking in any of the following ways: (1) By donation; (2) By annual subscription; (3) By shares in a Limited Liability Company; or (4) By bequest.

WUNDT'S GREAT WORK ON SOCIAL PSYCHOLOGY.[1]

The second part of the first volume of Professor Wundt's colossal work on social psychology comprises over 600 pages, and is a continuation of his analysis of language, to which the entire first part of this volume also was devoted. The present second part is made up of four chapters, viz.: the sixth, treating of verbal forms; the seventh, treating of syntax; the eighth, treating of changes of meaning; and the ninth, treating of the origin of language. The encyclopædic knowledge of the great psychologist is exhibited here to the best advantage, and the reader will find in the present volume the subject of language treated with unusual copiousness as well as analysed in every form in which it can possibly enter into consideration as a socio-psychological factor. The digests presented of linguistic researches, together with the bibliography indirectly given in the references, will render Professor Wundt's book a reference work of the highest order, and make it for many purposes a substitute for special works. It is impossible to do full justice to its contents without detailed analysis, and we shall consequently limit ourselves to a reproduction of some of the general considerations which Professor Wundt has advanced regarding the psychological conditions and causes of the exceedingly interesting phenomena presented by the historical *changes of the meanings of words*. This will render his mode of investigation clearer perhaps than a mere descriptive account.

The phenomena connected with changes of meaning are dependent upon conditions the thorough investigation of which in every single instance would be an absolutely impossible task, leading back as it does to the countless remote influences which have affected the historical development of speech, and encountering also formidable obstacles in the form of individual creations which, like all arbitrary acts, defy our attempts to disclose their originating motives. In fact, the infinite range of the conditions determining changes of meaning is manifestly the reason for the wide-spread opinion that such changes are invariably a product of accident and caprice. It is overlooked that even among the simplest, the most universal, and the most rigorously determined of natural phenomena, no concrete fact can be predicted with absolute precision as it actually is at a definite period of time and in a definite configuration of external circumstances. And so here we must content ourselves with showing that the changes in question arise necessarily from the conditions which are immediately given and which immediately precede; and since these immediate conditions are in their turn also natural phenomena likewise dependent on their spatial and temporal environment, we may regard it as

[1] *Völkerpsychologie*. Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythus und Sitte. Von Wilhelm Wundt. Leipzig: Verlag von Wilhelm Engelmann, 1900. Pages, x, 644. Price, bound, 18 marks.

perfectly justified from a logical point of view to assume that no phenomenon exists that is not uniquely determined throughout its entire chain of occasions and causes. The application of this assumption to the phenomena of changes of meaning is directly corroborated by the facts themselves. In the case of the great majority of the phenomena of psychic life, particularly those which form part of some connected intellectual development, definite motives admit of being disclosed which, while they do not always constitute the absolute and conclusive reason for the event, still point distinctly enough to it to justify us in concluding that the reason for its occurrence could be adduced if the antecedent motives were discoverable. For example, the word *gas* is one of the most arbitrary verbal creations imaginable. It was invented about the year 1600 by a Belgian physician and mystic, Baptiste van Helmont, as he himself expressly admits, "*paradoxi licentia*." It was not fully adopted until the nineteenth century, qualified forms of the word *air* still being used throughout the eighteenth century to describe the various gases,—for instance, "the fixed air" of Black for carbonic acid gas, and "dephlogisticated air" for oxygen. Yet despite the seemingly arbitrary character of Van Helmont's invention, we are nevertheless able to point very definitely to the associations which led him to the formation of the name. He tells us himself that he believed he had discovered in gas a sort of primal matter which was intimately related to the *chaos* of the ancients; and that, further, the word *gas* and another word *blas* (meaning *blow*) designated for him two parallel concepts,—*blas* was derived from the Dutch cognate of the German verb *blasen, to blow*, and was used by Van Helmont as a descriptive name for the cold air or ethereal fluid which according to the conception of the day emanated from the fixed stars. But the consonants *ch* and *g* in Dutch are phonetically almost the same as an aspirated *gh*, and consequently the word *gas* is distinctly revealed to be a resultant creation of the two associations *chaos* and *blas* (blow). It is not impossible that the association of the idea with the Dutch word for *spirit* (the cognate of the English *ghost*) may also have influenced the alteration of the initial consonantal sound of the word.

Now, concludes Professor Wundt, if the inventor of this new term had not himself definitely pointed to the causes and conditions of its creation, we to-day should be very likely to look upon the word as an absolutely capricious and arbitrary product.

Taking it for granted, accordingly, that there is by analogy a presumption in favor of conformity to law also in the growth of phenomena which have not been investigated as to their origins, we are led to distinguish two species of determining conditions, viz., the *general occasions* or conditions, and the *causes* proper. The notion of *conditions* is the more general and vaguer notion, while *causes* are conceived as the *immediate* determining conditions of an event, without which the event would either not have taken place or would have taken place differently. But as the conditions so called are in their turn dependent also on other more remote conditions, the range and compass of the conditions are in each individual case infinite in extent. Therefore, wherever there is occasion to go beyond immediate causes, the search for conditions must necessarily be limited to such as stand in some immediate connexion with the causes.

As contrasted with the vague and shifting notion of conditions, the notion of cause is rigorously circumscribed. Causes are such conditions only as are, when assumed, absolutely sufficient for the explanation of the phenomenon. For example in the instance above adduced, the associations with the word *chaos*, with the hypothetical substance *blas* (blow) and with the word *spirit* (ghost), are the three

sufficient causes of the term *gas*. The fantastic notions which led our alchemist to think of the primal *chaos* of the ancients; the origin of the views which were widely diffused in his time of an ethereal fluid emanating from the fixed stars; the origin of the designation *spirit* (ghost) for volatile substances,—all these are not causes in the restricted sense of the word, but conditions which, if they were followed farther, would lead the inquirer back to a vast domain of mystic concepts and mythological survivals and through these finally to the ultimate and boundless expanse of relationships subsisting between our civilisation and that of these remote epochs.

The situation is not otherwise with the phenomena which constitute normal and historical changes of meaning. In the case of the history of the word *pecunia* (money) among the Romans the sufficient causes are given in the fact that the notion of a medium of exchange was first associated with cattle (*pecus*), which were used for this purpose, and that afterwards the notion of other media of exchange, bronze and the precious metals, was successively associated with the same conception. On the other hand, the mutations of civilisation, the transition from trade in kind to trade in money, and all the other historical transformations upon which these changes depended, are part and parcel of the broader province of the "conditions" so called, which, if we exhausted them utterly, would comprise in the last instance all of Roman history and would go back even to still more remote prehistoric social movements and cultural conditions.

Accordingly, if the interpretation be restricted in the present case, as it is in others, to the most exact possible establishment of the causes, coincidently with which reference to the general conditions is only secondary and roughly possible, then the method of this interpretation will consist exclusively in a retrogressive and never in a progressive procedure. That is to say, in every case the causes can be sought only from the phenomena that are given; and effects cannot conversely ever be deduced from causes assumed or given. As a matter of fact, we are almost invariably obliged to employ this retrogressive procedure even in the investigation of natural phenomena, whenever an explanation is required of complex processes which have arisen without our deliberate interference or experimental control. Now, in the case of the development of the significance of words, we are concerned with phenomena the conditions of which we never control but which we can only investigate in the forms in which they are exhibited to our view in the course of their natural growth. Here, therefore, interpretation of the retrogressive sort only is possible; and not until we have actually accomplished such an interpretation in many cases and under varying circumstances are we able to obtain enlightenment as to the general nature of the causes. An auxiliary deductive procedure accompanying the inductive process here indicated is indeed possible, and consists in bringing the complicated facts which we are investigating into connexion with other more simple psychical processes, particularly with those with which we are acquainted from our experimental analysis of sensory images and their course of development. But owing to the great complications involved, certain peculiarities are intermingled with the effects which could not have been foreseen from mere analogy with simpler known facts, and in this way the domain of linguistic phenomena affords an important extension and complement to the results which inquirers have reached in the field of general psychology, and so claims the closest attention.

Finally as to mechanism, the immediate causes of changes of meanings are always *elementary processes of association*, such as are regularly exhibited and

traceable in their manifold forms from simple sense-perceptions through the ordinary operations of sensual recognition, to acts of memory performed by the individual consciousness. The conditions under which these causes operate are complex external circumstances which in many cases are definite historical facts and in others proceed from the action of the intellect itself as exerted upon its own vehicle, language. But if associations constitute the causes into which changes of meaning are resolved when we reduce them to their ultimate elements, nevertheless the entire causal field is not exhausted by them. On the contrary, the very function is neglected in this analysis which alone renders the coherent action of the elementary associations possible, the function which combines them into definite and single consolidated results. This function is *apperception*. No other domain of psychical phenomena affords so favorable an occasion for analysing the relation which obtains between these two unceasingly interacting psychical operations, the *associative* and the *apperceptive*, as language. And it is to the illumination of these fundamental processes that the results of the present investigation particularly redound.

BOOK NOTICES.

The International Globe Co., of Chicago, have published a flat globe, that is to say, a map of both hemispheres printed on either side of a large circle. The colors of the different countries are prominent, which has the advantage of bringing out their boundary lines boldly so as to be impressive to children. Around the equator the difference of time is marked by clock dials at intervals of fifteen degrees. The cable and steamer lines are indicated and, in addition, in the empty spaces of the oceans on the Southern Hemisphere the fauna and flora of the five zones are pictorially represented. The whole arrangement is a very convenient substitute for a globe, and has the advantage of taking no room. Along with the map is sold a geographical manual as a help for the teacher. The main drawback to this world's chart is the price, which is $2.00. (International Globe Co., Room 415 Continental National Bank Bldg., Chicago.)

A new magazine has been established in Chicago bearing the title *School Science*, which is designed to furnish knowledge and assistance to the science-teachers of our secondary schools. The editor, Mr. C. E. Linebarger, is a man of competence and thorough training, his specialty, physical chemistry, peculiarly fitting him for his labors. From its announcements the little journal would seem to have the support, not only of able educators in our own country, but also of scientists abroad. We wish the venture every success. The contents of the first number are as follows: Associations of Science Teachers, by Charles Skeele Palmer; High School Astronomy, by George W. Meyers; Metrology, a Foreword, by Rufus P. Williams; Research Work for Physics Teachers, by E. L. Nichols; Quantitative Experiments in Chemistry for High Schools, by Lyman C. Newell; A Teacher's Index of Current Physical Literature, by George Flowers Stradling; The Teaching of Physical Geography, by William H. Snyder; Some Ways of Depriving Germinating Seeds of Air, by Louis Murbach; A Neglected Feature in Fern Study, by J. A. Foberg; A Convenient Method of Determining the Density of Air, by A. W. Augur; Experiments on the Removal of Oxygen from the Air, by O. Ohmann; A Simple Form of Sciopticon, by C. W. Carman; Notes—Zoölogy, Biology, Geology, Chemistry; Book Reviews, Correspondence, etc. (*School Science*, A Journal of Science Teaching in Secondary Schools. Published Monthly, September to